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Morpho thoosa Smyth.

By ELLISON A. SMYTH, JR., Blacksburg, Va.

(Plate VIII.)

In March, 1903, I described and figured in the ENTOMOLOGICAL NEWS, Vol. XIV, No. 3, page 85, under the name of *Morpho thoosa*, a new variety or form of *Morpho polyphemus* Dby.-Hew. The male only was described from material taken at San Juan Evangelista, State of Vera Cruz, Mexico, and sent me by Mr. E. K. Harvey, of Los Angeles, California.

Since then Mr. Harvey has sent me additional specimens, including a female. I have carefully compared this female with twenty-one females of *polyphemus* and var. *luna*, and find it shows the same character of differences from these, that males of *M. thoosa* bore to one hundred and five males of *M. polyphemus*. I judge that *M. thoosa* will constantly average larger than *M. polyphemus:* males of *thoosa* are 5 3/16 inches in extent; of *polyphemus*, 4¾: one ♀ of *polyphemus* is 5½ inches, and one of *luna* 5⅝; the remainder of the twenty-one ♀ ♀ do not exceed 5 1/16: the one ♀ of *thoosa* is 5¼; as this is only 1/16 inch larger than the ♂, presumably it is under the maximum.

UPPER FIGURES MORPHO THOOSA SMYTH ♂ AND ♀. LOWER FIGURES MORPHO POLYPHEMUS DBY.-HEW. ♂ AND ♀.

The distal borders of the wings, upper surface, in *thoosa* ♀ are not buff as in var. *luna;* the whole under surface is more buff and has more prominent markings than ♀ ♀ of *polyphemus,* but less than *luna.* The ocelli are more pronounced than in *M. thoosa* ♂, but much less so, and less numerous than in *luna* or *polyphemus.* Apex of forewings heavily marked with black as in ♂ ♂, and general color of a greener pearly-lustre than in the two other forms. To describe further were to repeat my former description of the ♂. The accompanying illustration best contrasts the two sexes of *M. thoosa* with those of *M. polyphemus;* the upper pair are *M. thoosa;* the lower, *M. polyphemus* as typical as I could select from 126 specimens. The figures are reduced one-half.

As far as I can learn, *M. thoosa* belongs to the eastern coast, and *M. polyphemus* and *luna* to the central and western portion of Mexico.

A new Species of Phoebolampta (Tettigonidae, Orthoptera) from Cuba.

By James A. G. Rehn.

Phoebolampta cubensis n. sp.

Type:—♀; Havana, Cuba. (C. F. Baker.) [A. N. S. Phila.]

Closely allied to *P. magnifica* Brunner* from Haiti, but very considerably smaller and with the costal margin of the tegmen much more sinuate in the distal half, and apparently with a greater number of spines on the distal section of the ventral margins of the caudal femur.

Size medium; form distinctly compressed. Head gently sloping to the produced, subequal fastigium, which is very slightly elevated, with a very fine slight median sulcus and a subtruncate apex; facial fastigium touching the fastigium of the vertex; eyes moderately large, subspherical, quite prominent when viewed dorsad; antennæ filiform, in length distinctly exceeding the body and about equal to two-thirds the length of the tegmina. Pronotum with the dorsum flattened and regularly expanding caudad, the cephalic width about one-third the caudal, cephalic margin truncate, caudal margin arcuate with the faintest possible indication of angulation, lateral angles rectangulate but not sharp; disk punctate, much more thickly so caudad than

* Monogr. der Phaneropt., p. 352, tab. 7, fig. 103.

cephalad, a distinct V-shaped impressed figure on the cephalic portion; lateral lobes about half again as deep as long, the cephalic margin nearly straight, caudal margin flattened arcuate, ventral margin slightly sinuate with the ventro-cephalic angle distinct, humeral sulcus distinct, but not large or deep. Tegmina glabrous, the greatest width contained slightly more than three times in the length; costal margin regularly arcuate in the proximal three-fourths, distad of this following the general trend of the principal veins for a short distance then rounding to the apex, sutural margin gently bisinuate, one curve at the apex of the dorsal field, the other immediately proximad of the apex to which it rounds obliquely, the immediate apex rounded, width of the tegmen at four-fifths the distance from the base two-thirds the greatest width, which is at about the proximal third; radial vein diverging shortly proximad of the middle, furcate, the rami reaching the sutural margin. Wing extending beyond the closed tegmina by less than the length of the head, apex rectangulate. Mesonotum and metasternum with triangular lobes. Ovipositor very short, thick, but little curved, slightly narrowed and the apex very bluntly rounded; subgenital plate produced, narrow, compressed, keeled, the apex shallowly emarginate. Cephalic femora with four minute spines on the cephalic margin, the caudal margin unarmed; cephalic tibiæ with the dorsal margins unarmed except for the apical spines; auricles rimate. Median femora half again as long as the cephalic, the cephalic margin armed with six or seven small spines, caudal margin unarmed. Caudal femora about half as long as the tegmina, moderately but not strongly inflated proximad, tapering to the distal section which is thick when compared with the proximal two-thirds, ventral margins with twelve to thirteen spines, ventral sulcus narrow proximad, genicular lobes bispinose; caudal tibiæ considerably longer than the femora, heavy, compressed, subtrigonal in section, dorsal margins regularly spined, spines twenty-five to twenty-six in number, ventral margins with the spines few proximad, more numerous distad.

General color of the tegmina oil green, face pale apple green, dorsum of head very pale pinkish buff, dorsum of the pronotum pale malachite green, the lateral lobes and pleura olive-buff and the angles lined with ochraceous buff, eyes prouts brown; limbs wood brown becoming apple green distad.

MEASUREMENTS.

Length of body	26.5 mm.
Length of pronotum	6.8 "
Greatest caudal width of pronotum	6. "
Length of tegmen	46. "
Greatest width of tegmen	13.5 "
Length of wing beyond closed tegmina	2.3 "
Length of caudal femur	22.5 "
Length of caudal tibia	25. "
Length of ovipositor	3. "

The type is unique.

Economic Entomology.

By Owen S. Paxson, Devon, Pa.

Generally speaking, I am very much opposed to the practise of economic entomology as a usual thing or by the public. Such depredations as are caused by the Rocky Mountain locust, gypsy moth and San José scale are indeed serious, and, as these insects affect large areas, it is necessary to exterminate the pests, at least for the welfare of the human race. If allowed to continue they would become unbearable, for their natural enemies or foods are wholly or practically destroyed. The magnitude of the calamity is alone the reason for my change of mind. These cases of such paramount importance should be fought by scientific people. In fact, I think that all points on entomology should be in their hands and under their judgment, and not in that of the populace, who know nothing about such matters, and, when once started on these raids, cannot be stopped, except after years of trouble and expenditure.

No one living in North America two hundred years ago thought that the millions of birds then inhabiting the vast wilderness, could or would be destroyed in the way they have been. Why do not insects run such a chance, although reproducing themselves much more easily and in vaster proportions? It may sound foolish, but I thoroughly believe it will happen at a date not far distant; that is, if civilization will persist in carrying out its present plans. This continual clearing and burning leaves few places for insects to transform in or undergo their metamorphoses. All land around our large cities is persistently watched. The majority of private places are kept nearly as clean as a rug, for the leaves, rubbish and trees are continually disturbed. Thus we kill almost all the life and destroy the hibernating places around us. Even the adjoining fields, meadows and woodlands are watched on a smaller scale. They are frequently ploughed or burned over, thus destroying in a single day countless hordes, which serve as food for the wild life. Besides the destruction caused by man, the insects have all their natural enemies to contend with.

Year after year ground is reclaimed, so to speak, from nature,

and, when this happens, the great majority and probably all the life inhabiting this region is killed or driven away. How can anything contend with this condition? As the years pass, all these schemes will be multiplied in every way to an enormous extent.

Why advise a farmer or anybody to destroy insects just because a few of his plants are affected, and the trouble is only local? If anything is done, leave it to men of science. If the insects become general and a plague is threatened, it is only caused by some of man's ignorant notions in destroying the natural foods or enemies.

I have never approved of the general feeling that seems to control the actions of most men, of destroying nature no matter what the form or condition. Those who do so generally say they do it for sport, for under this mask we do things abominable to any decency. Thus the different branches of the several kingdoms have perished, and probably the insects will meet with a similar fate. Surely, these insects and lower animals are a joy to everybody. I cannot realize any person feeling differently. What would the earth be without them? Then let us all, and especially scientists, protect them in every way whenever possible, instead of following the old plan of killing everything we see and for no purpose. I think we live in a golden age; just think of the myriad of insects to delight the entomologist! They are so easily procured now, but we should look into the future and thus prevent this great catastrophe. Do not overstep our privileges and murder the innocents. History is full of such behavior, always with bad results in the end. The progress of the world, many will say, naturally clears the earth of its wild life, and, of course, this is so as long as we follow the present plan. But, I say, as long as we are civilized, why not act the part of civilization? Leave all, or the great majority, of animals to live the life we are enjoying. Surely, our existence will not be retarded by their presence, but benefited in more ways than we have the least idea of.

Of the virgin forests that covered practically all the east and west what a poor remnant remains to tell the sad tale.

Now their grandeur and magnificence are to be seen only in small unfrequented regions. Little did the woodchoppers of three centuries ago think of making such an impression on the solid wall that stretched for miles along the coast and inland for leagues. I doubt if anybody cared. What is the result? Why did not the learned of that day see the great danger? Their thoughts were for its destruction, thus giving them ready cash when other means failed, and at that time the forests were considered a great nuisance, so they were burned promiscuously and continually. Money is one of the greatest curses the world has known, and is often the real and only cause for the disappearance of nature's beauties. Who has not noticed the vanishing of our lovely wild flowers before the advance of civilization? They will in many instances die away altogether, while the few that are more fortunate may be found in the adjoining country. This year they are quite near home, but owing to the influence of man, will wholly disappear from their old haunts. The next season may see them across a nearby highway. Their pure and wonderful beauty is obliterated to make way for the rude and unwieldy works of man.

The buffalo well illustrates the fate of the mammals, for their countless numbers roamed over the broad prairies of the west, even far into Canada and Mexico. They were so thick as to blacken the earth for miles, but now only a few remain. The rest have fallen for money and "sport." How carefully and wisely did the Indians manage the killing of the few they sought, and then only for supplying themselves with food and shelter. It is almost incredible to think that we have behaved so barbarously. The birds likewise have faired badly, and are killed for their feathers. Already many beautiful, useful and wonderful species are practically or entirely extinct. Before this slaughter ceases many more will have perished or be reduced to remnants by the wickedness of man.

The insects have not yet decreased noticeably, and, if destined to succumb, will only disappear many years hence. Did not the animals, trees, etc., appear to be inexhaustible when

they roamed or ranged in multitudes across the new land? Only the thicker settling of the country can affect the Arthropods, but I think we are on the straight road to this result.

It is now too late, but we are beginning to understand the results of forest destruction. How greatly does it affect the climate! Or rather, the earth deprived of its covering becomes dried out, so that it is unable to withstand the natural droughts. So it appears to us that there is less rain. In other words. we think the weather has changed. I, for one, do not believe that it seriously changes the prescribed routine. The trees, however, are a great preservative of the earth's crust. Holding it much more firmly together they prevent terrible washouts at different seasons.

All creations were placed here for some good, not to be killed in a few years. The animal, vegetable and mineral kingdoms balance each other. When one portion or the other is destroyed in vast quantities the others are unbalanced, and thus the dependent ones also perish or change their food.

What right has man to be the judge? The results of his endeavors, as seen throughout the world, are mostly mean and unprincipled. Far better leave these things to nature, for she alone can make and solve her own problems.

Economic Notes on Aphids and Coccinellids.

By Roswell H. Johnson, Cold Spring Harbor, New York.

An experimental study of evolution in *Coccinellids,* such as I am engaged in, necessitates a thorough survey of the vicinity for aphids, in order that *Coccinellids* may be there collected and food furnished them. There naturally results a considerable amount of data not pertinent to my subject, but yet of value to economic entomology, which I wish to submit, even though it be fragmentary.

I have found aphids on the following plants in the vicinity of Cold Spring Harbor, Long Island, which I have not seen recorded from eastern North America:

Acalypha virginica L. (upon the roots).

Arctium minus Schk.

Aster multiflorus Ait.
Baccharis haelimiflora L.
Cakile edentula (Bigel.) Hook.
Cuscuta gronovii Willd. (indoors).
Cydonia japonica.
Deringa canadensis (L.) Kuntze.
Iva frutescens L.
Parsnip (on the flower stalks).
Potentilla litoralis Rydb. (indoors).
Rhamnus cathartica L.
Solidago sempervirens L.
Washingtonia longistylis (Torr.) Britton.

A second species has been found upon *Vicia faba* (indoors) and upon the cultivated chrysanthemum (indoors). A species occurs on *C. frutescens* (indoors) different from either of those on the cultivated chrysthanthemum. I realize that this list has merely the value of directing investigation by students of this family.

The variation in resistance to the attacks of aphids in the following plants has seemed to me noteworthy. Two variegated varieties of the myrtle—*Vinca minor*—are much attacked by *Aphis circumflexa,* when grown under glass, while the common non-variegated variety is but slightly attacked on its tender shoots. One succulent-leaved variety of the Paris daisy —*Chrysanthemum frutescens*—which I raised from seed under glass, was not attacked by the aphid so abundant on the typical specimens of the daisy growing alongside. The coccid of the chestnut is seldom seen, except on strong, rapidly growing shoots sent out from stumps. In collecting an aphid from the apple, I have noticed that full grown trees are not badly infested here, whereas spindling shrubby ones, such as are found along the highways and in orchards neglected from the time of planting, are sometimes much infected. The extermination of such trees, I should think, would assist in the control of the pest.

Several of the highly colored aphids can not be successfully fed to Coccinellids, such as *Aphis lutescens, Cladobius sp.,* and the red aphids of the golden glow, wild sunflower, iva, and

cockle-burr. The light red aphids of the goldenrod are eaten, however. Although some of the woolly aphids are eaten by Coccinellids, they are apparently discriminated against, especially a woolly aphid on *Crataegus. Alemodes* is not eaten by them.

Discrimination is shown by the fact that I have found only the following Coccinellids on the plants indicated: chestnut—*Cycloneda sanguinea;* Carolina poplar—*Adalia bipunctata; Solidago canadensis, Coccinella 9-notata;* willow—*Adalia bipunctata* and *Harmonia picta.*

The fact that *Adalia bipunctata* only was found on *Rhamnus cathartica* and *Euonymus europaeus* may, however, be due to the season, the aphids on these plants being the earliest species to be abundant. The much shorter generations of *Adalia,* as compared with *Hippodamia* and *Coccinella,* must assist it in its attack on these early aphids.

I have noticed the great effectiveness of small yellow syrphid larvæ both outdoors and in our vivarium. At some seasons, only a great deal of hand picking makes possible the raising of aphids. The syrphid seems to be more effective than any other enemy of the aphids here, and it attacks nearly, if not all, species, but I have not seen it attack *Aleurodes*—the white fly. Small spiders also are important indoor enemies of aphids. At times a fungus seems to produce a heavy mortality in the aphid of the parsnip.

The larvæ and adults of *Megilla maculata* are common on maize, and I have also found pupæ on the corn silk and leaves of a corn patch, in which I could see no aphids, either on the corn or weeds. They are apparently able to live upon pollen and spores without aphids. This may have some connection with the agility of the larvæ, which exceeds that of the other local Coccinellids, except *Cycloneda sanguinea.*

The period during which a female may lay fertile eggs after isolation has, in the case at least of *H. convergus,* exceeded that given by Burgess, attaining three and one-half months in one instance. I have noticed that in some cases eggs laid by females, which died within a few days, failed to hatch, although the eggs previously laid had been hatched. The last few

batches of eggs laid by a female before death have failed to hatch in several cases, even when a male was kept with the female. I am inclined to conclude, therefore, that failure of eggs to hatch is not necessarily due to sterility, as generally assumed, but may result in some cases from an unfavorable condition of the female. This possibility must therefore be borne in mind in experimental breeding.

Coleopterological Notes, Synonymical and Descriptive.

By H. C. FALL.

Several years ago (1901) a supposed new species of *Mycetina* was described by the writer (Trans. Am. Ent. Soc., XXVII, p. 304) under the name *endomychoides.* From a reading of Horn's descripoion the form in hand seemed to be distinct from *limbata,* but subsequent comparison with the type convinces me that the two are identical. *Endomychoides,* therefore, falls into synonymy.

A little later, on comparing some specimens collected by Professor Wickham, at Coeur d'Alene, Idaho, and sent me as *M. hornii,* with California examples of *hornii,* the two were found to be quite distinct. There can be no doubt that the Californian specimens are the true *hornii,* the differential characters separating this from the Idaho form and the Eastern *perpulchra* are shown in the following table:

Prothorax wider just before the middle than near the base, the sides distinctly sinuate posteriorly: humeral pale spot subbasal, not involving the umbone; dilation of posterior tibiæ of male beginning at or a little below the middle. . . . . **perpulchra** Newm.

Prothorax with sides parallel or slightly divergent posteriorly, not evidently sinuate before the basal angles: humeral pale spot involving the umbones.

Form less stout, elytra more finely punctate, size a little smaller; posterior tibiæ of male not dilated, but arcuately bent apically. **hornii** Crotch.

Form stouter, elytra more coarsely punctate, size larger; posterior tibiæ of male dilated at apical third . . . . . **idahoensis** n. sp.

These three species form a compact group, which must be separated subgenerically, if not generically, from both *limbata* and *testacea*. The above differences are quite sufficient for mutual separation, but there are a number of others that might be given, such as the relative depths of the transverse basal impression of the pronotum, the form of the scutellum, the prosternal impressed lines, etc. *Perpulchra* is widely distributed in the Eastern U. S.; *hornii* is known to me from both the Sierras and Coast Range of Middle California; Crotch also gives Oregon.

Alaophus nitidipennis.

This species, described by the writer in *The Canadian Entomologist*, August, 1905, p. 275, is unquestionably the same as *macilentus* Csy. The overlooking of Major Casey's description was due to the accidental omission of his species from the Henshaw List.

The following species recently received is certainly new:

Alaophus puberulus n. sp.

Rufotestaceous, elytra slightly paler; head and prothorax densely subrugosely punctate and somewhat dull; elytra more sparsely and finely punctate, shining; upper surface clothed with rather sparse but quite conspicuous short erect, pale hair. Antennæ slender, half the length of the body, second joint a little longer than wide, fourth shorter than the third and barely three times as long as wide; tenth nearly parallel, eleventh a little shorter than the tenth. Eyes much more prominent than the sides of the front, separated above by a distance subequal to the length of the fourth antennal joint, beneath by a distance one-third greater than the length of the second joint. Prothorax one-fourth wider than long, apex nearly as wide as base, sides broadly, evenly rounded, feebly sinuate before the hind angles, which are sharp and but slightly obtuse; disk evenly convex, broadly, feebly impressed near the middle of the side margins. Elytra four times as long and nearly twice as wide as the prothorax, humeri moderately prominent, sides nearly parallel and slightly arcuate to beyond the middle, punctures separated by rather more than their own diameters. Prothorax beneath closely punctate, metasternum and abdomen finely sparsely so. Basal joint of hind tarsus evidently shorter than the three following united, second and third joints slender, twice as long as wide or more. Length 6 mm.; width 2 mm.

Stockton, Utah.

Described from a single ♂ collected by Mr. Spalding and sent me by Mr. Knaus. Most nearly related to *gracilis*, but differing in the less elongate form, the erect pubescence of the upper surface, less approximate eyes and some other details.

Substituting *macilentus* Csy. for *nitidipennis* Fall, and including the present species, the table given by the writer in *The Canadian Entomologist*, XXXVII, p. 276, becomes as follows:

Table of **ALAEPHUS.**

Eyes small, very slightly more prominent than the sides of the front, separated beneath by a distance which is about three times the length of the second antennal joint; fourth joint of antennæ barely twice as long as wide . . . . . **pallidus.**

Eyes larger, much more prominent than the sides of the front; fourth joint of antennæ from nearly three to four times as long as wide.

Body subglabrous, the pubescence recumbent and very sparse, fine and inconspicuous.

Eyes separated beneath by a distance which is nearly twice the length of the second antennal joint; tenth joint of antennæ obconical, eleventh not shorter; elytra not much wider at base than the prothorax, strongly shining . . . . . **macilentus.**

Eyes separated beneath by a distance which is scarcely as great as the length of the second antennal joint; tenth joint parallel, eleventh shorter than the tenth; elytra much wider than the prothorax at base, moderately shining . . . . . **gracilis.**

Body sparsely but quite conspicuously clothed with short erect hairs.

Eyes separated beneath by a distance which is about one-third greater than the length of the second antennal joint, tenth joint parallel, eleventh shorter; elytra much wider than the prothorax. **puberulus.**

In addition to the above synonymy, the following may be announced at this time:

Microweisia (*Smilia*) *reversa* Fall = *atronitens* Csy.

Scymnus dentipes Fall = the ♂ of *haemorrhous* Lec.

Leptogenius virginicus Fall = *brevipennis* Csy.

Corymbites tigrinus is probably only a slight variety of *triundulatus* Rand.

Acmaeodera versuta Horn = the ♂ of *guttifera* Lec.

Agrilus illectus Fall = *jacobinus* Horn.

Jacobinus is out of place in Horn's table and in the following text, it being assigned to the section having the antennæ ser-

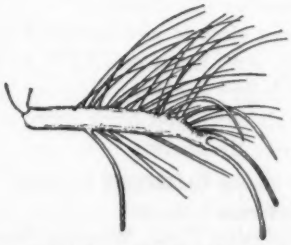
rate from the fourth joint, whereas the serration begins at the fifth joint. This error is, at least in part, responsible for the re-description of the species, since at the time of writing, comparison was made with those species only having the same antennal structure.

Aphodius blaisdelli Fall = *sparsus* Lec.

Both Dr. Blaisdell and myself were at fault in assigning this species to Horn's Group G, in which the middle and hind tibiæ are fimbriate with equal spinules. Mistakes of this sort are very easily made in this genus, especially with specimens in which the spinules have become nearly equal through wear. In the present instance I must confess that I gave this matter no attention, accepting without question the doctor's group disposition of the species. There are two specimens standing as *sparsus* in the Le Conte cabinet, the second one, however, is not like the one bearing the label and has probablv since been placed there conditionally; it is probably a member of Group G, but I did not take time to verify this supposition. This species, which was taken in numbers by Dr. Blaisdell, near San Francisco, in a wood-rat's nest, has lately been taken sparingly by both Dr. Fenyes and myself at Pasadena in similar situations.

Oxoplus marginatus Lec.=the ♂ of *cruentus* Lec.

This synonymy is announced in the Le Conte bibliography, by Henshaw, but appears to have been rejected later. Mr. Henshaw tells me that he does not know by whom it was proposed, or on whose authority it was annulled; I have no doubt, however, of its correctness.



Clasper of *F. vexator* Coq., described in this journal, Vol. xviii, p. 102.

The Bees of Nebraska.—II.

By MYRON H. SWENK and T. D. A. COCKERELL.

FAMILY PANURGIDÆ (Concluded)

Genus **SPINOLIELLA** Ashmead.

1. **Spinoliella australior** Cockerell.

Glen, Crawford and Warbonnet Canon, Sioux County, Nebraska, July 28 to August 17, common at flowers of *Cleome serrulata* and occasionally on *Solidago* also. One would expect to find *S. scitula* Cresson here also, but all the specimens as yet captured are distinctly *australior;* the differences between the two species, though not great, are very constant.

2. **Spinoliella helianthi** n. sp.

♀.—Length 6 mm.; clypeus (except for two large, separated, basal, black spots), labrum, mandibles, supraclypeal area, dog's ear marks, and lateral face marks including whole of sides of face up to level of antennæ and a little beyond along the orbits, bright yellow. Rest of head shining black, the front coarsely, distinctly punctured, the cheeks indistinctly so. Antennæ black, the flagellum pale brown except the basal joints above, which are blackish. Front with long, erect, dense, gray pubescence, cheeks with similar but shorter and thinner pubescence. Thorax black, dorsum punctured like the front, clothed with long, gray hair, denser and paler on the pleura. Tegulæ shining brown. Wings hyaline, nervures brown. Abdomen black, segment 1 with a complete, median, deep yellow band, 2 with widely interrupted lateral bands, 3 and 4 with broad complete bands, fifth segment largely yellow. Legs black, with all the tarsi and knees and the anterior tibiæ, except for a black spot above and below, yellow. Legs and tip of abdomen with long, erect, whitish hair.

Type:—Warbonnet Canon, Sioux County, Nebraska, July 12, 1901, on *Helianthus* (M. Cary), ♀.

S. helianthi is not close to any described species. It runs in the table in Trans. Am. Ent. Soc., XXV, p. 195 to *S. zebrata,* which is a much larger and very different species. The deep yellow marks of abdomen and black spots on the clypeus will serve to characterize the species.

Genus **CALLIOPSIS** F. Smith.

1. **Calliopsis andreniformis** F. Smith.

Lincoln, Omaha, West Point, Weeping Water, Cedar Bluffs, and Carns, Nebraska, flying abundantly from May 31 to July

20. Although essentially a vernal species, there is a female specimen collected at West Point, September 19, 1903, on *Aster* by Mr. J. C. Crawford, which may indicate a feeble fall brood. During latter June and July it flies principally at *Petalostemon violaceus* and *P. candidus, Rosa pratincola, Symphoricarpos occidentalis, Asclepias* sp. and *Melilotus alba.*

2. **Calliopsis coloradensis** Cresson.

Lincoln, West Point, Gordon, and Harrison, Nebraska, flying from August 29 to October 1, principally at flowers of *Solidago.*

3. **Calliopsis verbenae nebraskensis** Crawford.

Lincoln, Neligh, and Glen, Nebraska, July 4 to August 7, at flowers of *Verbena.*

Genus **PANURGINUS** Nylander.

1. **Panurginus malvastri** n. sp,

♂.—Length 8 mm.; clypeus evenly convex, very sparsely and finely punctured, and, together with the inner edge of the mandibles, bright chrome yellow, the rest of the head shining black, finely and rather sparsely punctured, closely so on the vertex. Antennæ black, the flagellum obscurely brownish beneath. Dorsum of thorax shining, very finely and sparsely punctured, the basal area of metathorax nearly smooth. Tegulæ testaceous. Wings clear, the nervures brownish basally but becoming black toward apex of wing. Legs mostly yellow, the coxæ, trochanters and more or less of the bases of the femora black, the black covering most of the posterior face of the anterior and intermediate femora. Abdomen shining, finely and sparsely punctured, the first segment subimpunctate medially, the posterior margins of segments 1-5 deeply depressed, the depressed margins of 1-3 markedly testaceous. Front, cheeks, dorsulum and pleura, legs and tip of abdomen with long, erect, thin, white hair.

♀.—Length 9 mm.; similar to the ♂, but the clypeus and whole of mandibles black, the legs black with only the anterior knees and a stripe down the front of anterior femora yellow, the pubescence everywhere denser and tinged with ochreous, abdominal segments 1-4 depressed and only first two feebly testaceous.

Types:—Pair taken in copula, Warbonnet Canon, Sioux County, Nebraska, June 13, 1901, on *Malvastrum* (M. Cary).

Paratypes:—Type lot, 3 ♀; Jim Creek, Sioux County, June 22, 1901, on *Malvastrum,* 6 ♀.

This quite distinct species runs out in the tables to *P. clypeatus* Cresson = *P. cressoniellus* Ckll., but is easily distinguished by the color of the legs, and other characters.

2. **Panurginus innuptus** Cockerell.

Present over the entire state, but much more abundant westwardly. Warbonnet Canon, Jim Creek, Crawford, Bridgeport, Haigler, Springview, Carns, Niobrara, Long Pine, Neligh, Broken Bow, West Point, and Lincoln. Flies from June 16 to to August 28, visiting the flowers of *Brauneria angustifolia, Ratibida columnaris, Helianthus annuus and H. petiolaris, Grindelia squarrosa, Petalostemon violaceus, Medicago sativa* and various species of *Solidago*. We have numerous pairs taken in copula. The male often lacks the black dots on the clypeus and on the lateral face marks.

3. **Panurginus renimaculatus** Cockerell.

Lincoln and West Point, flying at the same time and upon the same flower as *P. ornatipes*, including also species of *Aster*. In a series of thirty-three specimens of this species from Lincoln, there are two males. The male, hitherto unknown, is distinguishable by its small size (5.5 mm.), black tubercles, black nervures and stigma, and strongly narrowed, deeply emarginate median process of labrum.

4. **Panurginus stigmalis** n. sp.

♂.—Length 8 mm.; clypeus, labrum, mandibles and lateral face marks extending nearly to bases of antennæ and ending obtusely, bright yellow, the remainder of the head black. Median process of labrum with its sides forming distinct ridges, converging toward the slightly emarginate tip. Clypeus uniformily closely punctured. Antennæ black, with joints 3-11 bright brownish testaceous beneath. Mesonotum coarsely, closely punctured, pleura very coarsely punctured, metathorax finely and indistinctly punctured, its base with a row of short irregular striæ. Tubercles yellow. Tegulæ testaceous. Wings hyaline basally but becoming darkened toward their apices, the nervures brownish fuscous, stigma very large and dark. Legs black, with all the tarsi and knees, anterior tibiæ except a spot behind, and both ends of intermediate and posterior tibiæ, yellow. Abdomen deep shining black, basal segment subimpunctate, the following ones sparsely but distinctly punctured basally and especially laterally, apical margins of

segments 1-5 with depressed, smooth, glossy areas. Pubescence very short, scant, entirely white.

♀.—Length 8.5 mm.; like ♀ of *P. simulans* but nervures paler.

Types:—Glen, Sioux County, Nebraska, August 12, 1906, on *Helianthus* (H. S. Smith), ♂, ♀.

Paratypes:—Type lot, 1 ♀; Warbonnet Canon, August 16, 1906 (L. Bruner), 1 ♂.

This species belongs to the *labrosus—labrosiformis—solidaginis* group, but is too large for any except *labrosus,* which, however, has a yellow spot above the clypeus. It must be very close to *labrosus,* and possibly represents only a larger western subspecies of it. The female differs from that of *labrosus* in its larger size and black tubercles. We have had no opportunity of making actual comparisons of the two species.

5. **Panurginus expallidus** n. sp.

♂.—Length 7 mm.; clypeus, except for its extreme latero-apical prolongations which are black, labrum, broad lateral face marks running up almost to bases of antennæ and ending acutely, and a small, triangular supraclypeal spot, bright yellow, the rest of the head, including the mandibles, black. Clypeus and face uniformly coarsely and fairly closely punctured, much more coarsely and closely so on the vertex. Antennæ black, the scape coarsely punctured, joints 4-11 bright reddish brown beneath. Mesonotum coarsely and closely punctured except on the disk, and bearing three short impressed lines in front, mesopleura very coarsely punctured. Tubercles yellow. Metathorax with a row of short striæ at base, its posterior and lateral faces finely, indistinctly punctured. Tegulæ testaceous. Wings hyaline, the nervures pale brown, the stigma dark brown. Abdomen shining, first segment impunctate, following segments finely and closely punctured, apical margins of segments 1-5 depressed, smooth, tinged with testaceous. Legs black with all the tarsi and knees, ends of intermediate and posterior tibiæ and whole of anterior tibiæ, except a black median posterior area, yellow. Pubescence sparse, densest on mesonotum, pleura, legs, and sides and tip of abdomen, entirely white. Median process of labrum broad, its sides moderately converging and straight, its apex distinctly emarginate.

♀.—Unknown.

Type:—Lincoln, Nebraska, August 28, 1900, on *Helianthus* (L. Bruner) ♂.

This species is also a member of the *labrosus* group, but is too large for *labrosiformis* and *solidaginis,* and differs further

in the yellow tubercles and entirely yellow hind tarsi; from *labrosus* it differs in its pale brown, instead of fuscous nervuration, its black mandibles and the three impressed lines on base of mesonotum. It is really very close to *P. stigmalis,* just described, but differs in its uniformly hyaline wings with their paler nervures and stigma, black mandibles, yellow supraclypeal spot, and differently shaped median process of labrum. The face markings resemble those of *P. rudbeckiae,* but it differs at once from that species in its broader face, brown flagellum, and pallid nervures.

6. **Panurginus simulans** n. sp.

♂.—Length 7.5 mm.; agrees with the description of *P. expallidus* to which it is very closely related, but differs as follows: Lateral face marks ending obtusely above; mandibles with a median yellow band; median process of labrum narrower and more distinctly emarginate; basal half of clypeus with a median impunctate line; front of scape bright yellow; striæ at base of metathorax extremely short, not over one-third as long as in *expallidus;* abdomen somewhat less densely punctured.

♀.—Length 8 mm.; like the ♂, except as follows: Head entirely black, much more coarsely punctured, the median impunctate line of clypeus poorly defined; antennal joints 5-10 obscurely brownish beneath, joint 3 slender, exceeding 4 plus 5; mesonotum much more finely and sparsely punctured, the disk polished and subimpunctate, mesopleura with scattered, coarse, shallow punctures; striæ at base of metathorax longer, irregular, and sometimes indistinct; entire abdomen polished and its segments subimpunctate, except basally and laterally where the punctures are small and sparse, segments 1-4 with broad depressed testaceous margins; legs black except yellow spots on four anterior knees, tubercles black; median process of labrum with its sides sinuate and its base crossed by numerous oblique striæ, its apex emarginate.

Types:—Nebraska City, Nebraska, September 7, 1901, on *Helianthus annuus* (M. A. Carriker, Jr.), ♂; do., September, 14, 1901, ♀.

Paratypes.—Type locality, September 14, 1901, on *Helianthus* (M. A. Carriker, Jr.), 1 ♀; do. on *Grindelia squarrosa,* 1 ♀; Lincoln, Nebraska, 1 ♀; West Point, Nebraska, September 2, 1900, on *Helianthus* (J. C. Crawford), 4 ♀.

The relationships of this species are practically identical

with those of *P. expallidus,* which it greatly resembles, but from which it differs as above, and the comparison there given will apply equally well, except as to the color of the mandibles.

7. **Panurginus ornatipes** (Cresson).

A critical comparison of ♂ and ♀ cotypes of *Panurginus nebrascensis* Crawford with speciments of *P ornatipes* Cresson, shows the two to be synonyms, the name *ornatipes* having priority. *Panurginus boylei* Ckll. is to be considered a subspecies of *P. ornatipes* characterized by its wholly dark scape, representing in the mountains of New Mexico the typical form, which ranges in the plains and foothills from Texas to Nebraska. We have *ornatipes* from Lincoln, West Point, Broken Bow, and Glen, August 14 to September 18, flying commonly at *Grindelia squarrosa* and various species of *Solidago,* including *rigida* and *missouriensis.* The species has been found nesting at the Lincoln salt flats.

8. **Panurginus horizontalis** n. sp.

♂.—Length 8.5 mm.; clypeus, labrum, mandibles, supraclypeal area and lateral face marks up to level of tip of supraclypeal area deep yellow, its upper level forming a straight horizontal line. Antennæ deep black, the front of the scape with a yellow line. Face coarsely punctured, and with a prominent median ridge between the bases of antennæ. Mesonotum shiny, coarsely and closely punctured, the base of metathorax with a row of short striæ, rest of metathorax dull, finely, closely punctured. Tubercles yellow. Tegulæ testaceous. Wings dusky, especially toward their apices, the nervures black, stigma dark brown. Legs black, with all the tarsi and knees, ends of all the tibiæ and the front face of anterior femora, deep yellow. Abdomen finely and sparsely punctured, the basal segment subimpunctate medially, the apical margins of segments 1-5 broadly depressed, the depressed portions smooth and impunctate. Sides of abdomen fringed with long pale hairs, crossing in a loose fringe at the bases of the depressions on 2-6. Thorax, head and legs with short scattered pale hair, tinged with ochreous on mesonotum and vertex.

♀.—Unknown.

Type:—Glen, Sioux County, Nebraska, August 21, 1906 (P. R. Jones), ♂.

This species is related to *P. ornatipes* (Cresson), but is much larger and differs in the face markings, and other details. It is allied to *P. compositarum* Rob., but differs in much greater

size, yellow mark on scape and tubercles, more black on anterior femora, etc. It is very close to *P. piercei* Crawford, but has the front of scape yellow and the wings darker; possibly it may prove to be only a variety of *piercei*.

9. **Panurginus piercei** Crawford.

Lincoln, West Point, Gordon, and Glen, Nebraska, August 12 to September 12, flying at *Grindelia squarrosa, Helianthus annuus, Bidens chrysanthemoides* and *Solidago*. This species is quite variable in the male; frequently the dog's ear marks are partly or wholly black, and one specimen in our series of eleven has the tubercles black also.

The Nebraskan species of this genus may be separated by the following tables:

MALES.

Pale color of face confined to clypeus, which is evenly convex and very sparsely punctured; 8 mm. . . . . **malvastri** n. sp.

Pale color of face not confined to clypeus . . . . . 1.

1. Supraclypeal area black, or with only a small yellow spot; wings hyaline . . . . . 2.

   Supraclypeal area yellow; wings dusky . . . . . 6.

2. Labrum and mandibles black; 7.5 mm . . . . . **innuptus** Ckll.

   Labrum yellow . . . . . 3.

3. Tubercles black; nervures blackish; smaller, only 5.5 mm. long. **renimaculatus** Ckll.

   Tubercles yellow; nervures brownish; over 7 mm. long . . . . . 4.

4. Median process of labrum more strongly narrowed toward the scarcely emarginate apex, its sides distinctly sinuate; stigma brownish-fuscous; 8 mm. . . . . **stigmalis** n. sp.

   Median process of labrum less strongly narrowed toward the distinctly emarginate apex, its sides straight; stigma pale brown; 7.5 mm. . . . . 5.

5. Clypeus uniformly punctured; scape wholly black; lateral face marks acute above; striæ at base of metathorax longer. **expallidus** n. sp.

   Clypeus with a basal median impunctate line; scape yellow in front; lateral face marks obtuse above; striæ at base of metathorax shorter . . . . . **simulans** n. sp.

6. Clypeus uniformly punctured; upper limit of yellow on face curved; 6 mm. . . . . **ornatipes** (Cress.).

   Clypeus with a median depressed impunctate line; upper limit of yellow on face straight; larger, 8-8.5 mm. . . . . 7.

7. Scape yellow in front . . . . . **horizontalis** n. sp.

   Scape wholly black . . . . . **piercei** Crawf.

FEMALES.

Front and vertex very sparsely and weakly punctured, shiny; 9 mm. **malvastri** n. sp.

Front and vertex strongly punctured . . . . . 1.

1. Hind tarsi ferruginous . . . . . 2.
   Hind tarsi black . . . . . 3.
2. Clypeus entirely black, no supraclypeal mark; 8 mm. . **innuptus** Ckll.
   Clypeus with a yellow mark combining with yellow supraclypeal spot; 8 mm. . . . . **renimaculatus** Ckll.
3. Wings smoky, nervures black; smaller, 7 mm . . . **ornatipes** (Cress.).
   Wings clear, nervures brownish; larger, 8 mm. or over . . . . . 4.
4. Mesonotum finely punctured, sparsely so on disk; clypeus separatedly and less coarsely punctured; joint 3 = 4 + 5 . . **piercei** Crawf.
   Mesonotum coarsely punctured; clypeus coarsely puncto-striate; joint 3 exceeding 4 + 5 . . . . . 5.
5. Nervures dark brown . . . . . **stigmalis** n. sp.
   Nervures pale brownish-testaceous . . . . . **simulans** n. sp.

(The females of *expallidus* and *horizontalis* are unknown—possibly they are not distinguishable from *simulans* and *piercei*.)

Genus **PSEUDOPANURGUS** Cockerell.

1. **Pseudopanurgus fuscipennis** (Crawford).

The only records of this bee are the two cotypes collected by Mr. J. C. Crawford, at West Point, Nebraska, September 18 and 20, 1903, on *Bidens chrysanthemoides*. It is suggested that this species is likely to prove the same as *P. aethiops* Cresson, but we have not been able to make a direct comparison, so leave it as distinct. *Protandrenopsis* Crawford, however, is the same as *Pseudopanurgus* Ckll.

Genus **PROTANDRENA** Cockerell.

1. **Protandrena asclepiadis** Cockerell.

Entire State except in Transition zone of Sioux County; West Point, Weeping Water, Carns and Dundy County, Nebraska, flying during July on *Petalostemon violaceus, Solanum rostratum, Melilotus alba, Symphoricarpos occidentalis* and *Medicago sativa*. *P. bancrofti* Dunning, described from Colorado, is the female of *P. asclepiadis* Ckll., and the species should be known by the older name, as above.

2. **Protandrena cockerelli** Dunning.

Distribution the same as that of *asclepiadis;* specimens of both sexes are from Lincoln, Neligh, Carns, and Benkelman, Nebraska, taken July 1-26, on *Petalostemon violaceus, Solanum rostratum and Cassia chamaechrista.* The two species may be separated thus:

FEMALES.

Tubercles and a spot on tegulae yellow; supraclypeal area black, a yellow subtriangular mark occupying the upper half of clypeus; wings heavily clouded . . . . . **asclepiadis** Ckll.

Tubercles black, tegulae rufo-piceous, without yellow; supraclypeal area mostly or entirely yellow, sides of face with yellow spots, the upper half of clypeus yellow, with two black spots; wings much less clouded . . . . . **cockerelli** Dunning.

MALES.

Tubercles and a spot on tegulae yellow; upper margin of yellow area on face uneven, highest medially; less shiny . . . **asclepiadis** Ckll.

Tubercles dark, tegulæ rufo-piceous, without yellow; upper margin of yellow area on face perfectly straight, more shiny. **cockerelli** Dunning.

Appendix:—For the convenience of students, we wish to take the opportunity of here describing another interesting new *Spinoliella.*

Spinoliella hesperia n. sp.

♀.—Length 7 mm.; clypeus, except two very small basal black dots, labrum, mandibles except tips, supraclypeal area, dog's ear marks and lateral face marks extending above level of antennæ and running up in a narrow line along orbits nearly to vertex, bright yellow. Vertex with two large, irregular yellow spots, which occupy most of the area between the lateral ocelli and the eyes. Antennæ black, with the front of the scape yellow and the flagellum brownish beneath. Thorax black, the prothorax with a narrow transverse yellow band, the tubercles, postscutellum and a spot at base of tegulæ also bright yellow, rest of tegulæ black. Wings clear, nervures dark brown. Abdomen black, the middle of segments 1-4 with very broad, bright yellow transverse bands, interrupted medially on 1 and 2, very broadly on 2, complete on 3 and 4. Legs black, with all the knees, first four tarsi, anterior tibiæ and intermediate tibiæ, except for large spots on each side, yellow. Front, whole of thorax, legs and tip of abdomen with short, erect, fairly dense gray pubescence.

♂.—Length 6 mm.; face marked as in ♀ except that the lateral marks

run broadly up to vertex and end truncately, and there are no yellow spots on vertex. Antennæ wholly yellow except for a black line on top of scape which extends, though broken, along the basal half of flagellum also. Segments 1-6 of abdomen with complete transverse bright yellow bands, broad on 1-4 with the anterior middle notched and with an oblong black mark near the posterior margin on each side. Legs bright yellow, except for black marks on the back of anterior and intermediate tibiæ, femora, trochanters and coxæ, the posterior coxæ, trochanters, and basal two-thirds of femora black.

Types:—Southern California, ♂, ♀. (Collector unknown). Also a single ♂ paratype from type locality. This species is notable for the light face in both sexes. The general appearance of *S. hesperia,* is much like *S. scutellaris,* known only in the ♂, which was described from the same State, but it is much smaller and differs in several minor details. The hind legs of the ♂ are suggestive of *S. pictipes,* which is, however, otherwise quite different.

Notes on Lachnus platanicola Riley.

By Warren T. Clarke, Auburn, Alabama.

Early in November of last year, 1906, the writer's attention was drawn to certain aphids found upon limbs of the sycamore in the city of Montgomery, Alabama. On investigation, these proved to be representatives of the species *Lachnus platanicola,* first described and figured by Riley, in American Naturalist, 17, p. 198; 1883. Townsend, in Insect Life 1, pp. 197-198, 1888, and Oestlund, Aphidæ of Minnesota, p. 32, 1887, also made brief mention of the insect, while Weed, in Insect Life, 3, pp. 286-287, re-describes and figures it very fully. Reference is made to the above bibliography for technical description of this giant among the Aphididæ, the notes here given being merely intended to record its presence in Alabama as late as November, 1906, and further to record certain observations made upon it at the time.

My notes read as follows: "*Lachnus platanicola* Riley, on *Platanus occidentalis* (sycamore). Localities, Montgomery County, Randolph County and Mobile County, Alabama. Invariably on under sides of smaller limbs. Colonies large and

much exudation of 'honey dew.' Found present apterous and winged viviparous females and winged males."

The process of viviparous reproduction was observed. The fully grown female (measuring in the two cases noted, four millimeters in width at the middle of the abdomen and seven millimeters in length), apparently became restless, waving her long hind legs about in the air and swinging on the limb, from side to side, her inserted beak acting as a mooring point. This active and somewhat convulsive movement was kept up for three or four minutes and then the female became quiet. At the end of another three or four minutes activity would again begin, but not so pronounced as at first, and the young insect began to appear. At this point the activity of the mother *Lachnus* ceased and the new-born insect freed itself from her by its own efforts. For a few minutes after birth the young *Lachnus* remained quiet, apparently resting from its exertions and drying, and then backed away and found some unoccupied spot on the twig. Here it settled down, and in about an hour after birth it had inserted its beak into the twig and had begun to suck. Observations were made for two hours in each case during the warmest time of the afternoon, from one to three o'clock. In both instances three young were born in the time mentioned. In one case, observations were continued for one hour longer, from three to four, and no young were produced during this period. It was not possible for me to make further observations, but the evidence so far seems to point to the young being born only during the heat of the day.

While the winged males were present no oviparous females were seen and no eggs were found.

This *Lachnus* was not generally distributed through Alabama last year, for the winter found but the three trees with the insect present, though many sycamores were examined.

It seems to be of no special economic importance.

I SHALL be glad to undertake the determination of American Syrphidae for any of the readers of the NEWS.—RAYMOND C. OSBURN, Columbia Univ., New York.

A New Genus of Atropidae.

By SAMUEL E. WEBER, Lancaster, Pa.

The Atropidæ were originally set apart from the Psocidæ as possessing neither wings or ocelli, but in the three genera *Psoquilla* Hagen, *Dorypteryx* Aaron, *Psocinella* Bangs (*Psocatropos* Ribaga) we find in all of them one pair of rudimendary venated wings. To these I may add a fifth genus with fully developed ocelli and possessing two pairs of venated wings: we have then, as the generic term implies, an Atropid with ocelli.

OCELLATARIA gen. nov.

Fully developed ocelli. Head oblong. Emarginate on the vertex. Clypeus small. Lips prominent. Eyes not prominent, composed of small ocelli. Antennæ filiform longer than body, 18 to 30 articulations beyond two stronger basilar joints. Palpi four-jointed, the last joint tapered to a point at apex. Maxillæ tridentate, meso- and metathorax free. Two pairs of rudimentary venated wings. Femora not dilated. Tibiæ half as thick as femora, and longer than femora. Tarsi three jointed, the first joint longest, the second shortest. Claws bidentate. Body very scantily clothed with hair.

This genus differs from all the other Atropidæ in that it has not a prominent clypeus, and its head is more oblong than that of other genera and is more prominent between the eyes, and is emarginate on the vertex. The ocelli contrast this genus most strikingly from other described Atropidæ. A further difference in structure is the two pairs of venated wings found in *Ocellataria,* which does not occur in any of the other genera.

Ocellataria gravinympha sp. nov.

Length (♂) 1.7-2 mm.; (♀) 2.-2.3 mm. (Fig. I.)*

The ground color of the body is of a faint yellowish-white covered by a fine granular layer of bluish grey, most profuse on the ventral surface of the abdomen and on the legs, which are darker than the other parts of the body, with the exception of the borders and veins of the wings, which, like the eyes, are black. The head appears lighter in color than the other parts of the body; it is darker from the line

*This figure without description appeared in an article on "The Possible Dissemination of Tubercle Bacilli by Insects," N. Y. Med. Journal, Vol. lxxxiv, No. 18, p. 884, November 3, 1906. This paper is an example of the economic importance of the Psocidæ.

of the eyes and ocelli back and lighter from that line to the mouth. A few white hairs clothe the head, clypeus and lips, and are more numerous over the latter. Maxillary palpi white. Antennæ white. A fox-red band extends forward from the eye and becomes obsolete at the root of the antennæ. A light fusion of the same color is found surrounding the anterior ocellus, extending towards the clypeus. The ocelli are mounted in three beautiful rounded dark cherry-red bodies.

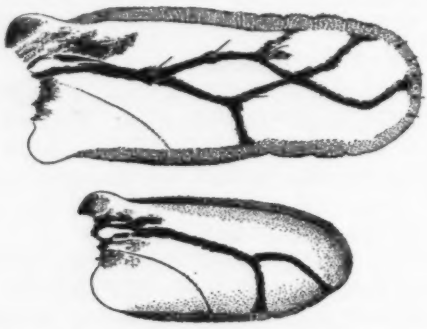


Fig. 1.—1st and 2nd wings of *Ocellataria gravinympha*.

The prothorax marked on the side by a fox-red stripe. Superior surface of femora darker than the inferior. The mesothorax is light reddish-brown on the dorsum, and towards the anterior border contains a light median spot. Under the wings it is white. The metathorax is marked the same on the dorsum. The wings are of a transparent glassy white structure. The margins and veins black. The first segment of the abdomen is white; the second, third, fourth, fifth and sixth are bluish-grey on the dorsal surface, the seventh is lighter in color, the eighth and ninth or apical retractive portion of the abdomen is dark. To the unaided eye the general color effect of the insect is that of a dark greyish spotted body with a faint yellowish head. With the hand glass, appear the beautiful red mounted ocelli and black eyes and yellow head, dark thorax and wings, the white first and seventh abdominal segments with the rest bluish grey, which renders the insect of a spotted appearance.

The first pair of femora are slightly dilated and are larger than those of the middle or hind pair. The front tibiæ are slightly longer than the femora; the tarsi nearly as long as the tibiæ, the first tarsal joint is longer than the combined length of the second and third. The middle pair of tibiæ are about one-fifth longer than the femora; the tibiæ are one-fourth longer than the tarsi; the first tarsal joint one and one-half times longer than the second and third joints

combined. The tibiæ of the hind pair are nearly twice the length of the femora; the tarsi two and one-half times longer than the tibiæ; the first tarsal joint twice as long as the second and third. The legs are sparsely clothed with short hair. The first and second joints of the tarsi are armed with two little spurs on the under side of their apices. Claws, bidentate. Two pairs of venated hyaline wings; the first pair

Fig. 2.—Mandibles and maxillæ of *O. gravinympha.*

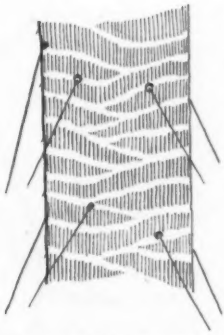


Fig. 3.—Portion of posterior tibia showing arrangement of epiderm.

three times as long as wide, and reach to, or extend half way over the first segment of the abdomen. The attachment to the mesothorax extends over nearly the whole width of the wing at its base. It is vested by a heavy aculeate border and veins. The large single vein takes its origin about the middle of the base, then makes a slight turn towards the anal side, then to the costal side, when it bifurcates to form a lozenge-shaped discoidal cell about the middle of the wing. On the anal side it sends off a branch nearly at right angles which extends to the border. On the costal side further towards the apex another

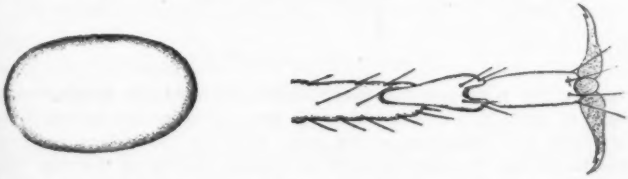


Fig. 4.—Egg of *O. gravinympha*, much enlarged, on left. Apical 3rd of 1st tarsus, on right.

branch is sent out, very heavy at its origin and very light for two-thirds of the distance to the margin. At the apical end of the discoidal cell two branches are given off, one extending to the costal, and the other to the anal, side of the apex of the wing. On the border of the wing on each side occur from 4 to 5 infundibulæ, each one of which is clothed with a small seta. A few larger setæ are scattered over the

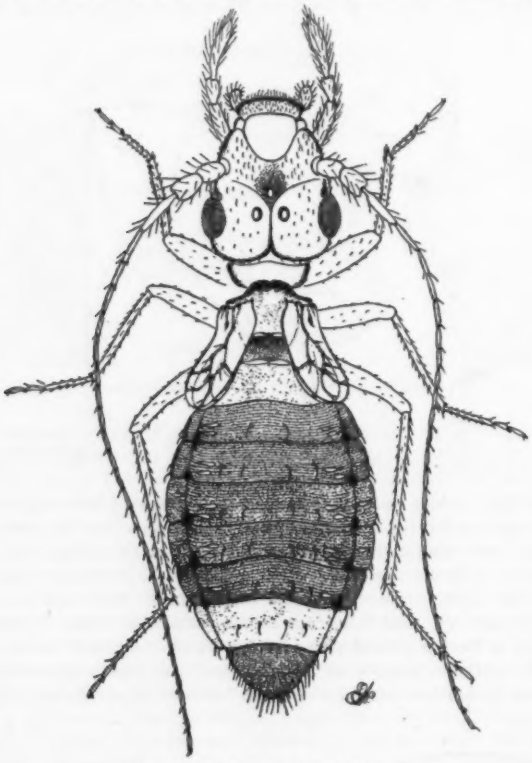


Fig. 5.—*Ocelloria gravinympha* (♀).

veins. The wing presents an undulating surface; the attachment at base is high, then it descends and rises again at the basilar third at about the bifurcation of the vein, which is the highest point of the wave, then it curves downward through middle of discoidal cell, takes a gradual rise, and comes to a higher point at the apical end of discoidal cell, after which it runs flat to the apex. The pos-

terior wings are shorter and narrower than the anterior pair, the costal margin nearly straight. Apex obtuse. A simple vein extends from the base obliquely towards the anal side and bifurcates, one simple branch extending to the apical margin on anal side, the other to anal border beyond the middle, forming a triangular cellule.

Habitat.—Lancaster, Pa. It is an indoor species.

Types.—Two males and one female, No. 46,844, U. S. N. M.

In its movements it is unlike many other Psocids, since it generally walks about slowly and runs only when disturbed. It has a peculiar lateral or duck-like motion of the head when walking which is not possessed by any other species known to me in this family. It does not jump. It does not spin. I have found this species to remain in a cellar, where they were placed in several boxes of bones, and to breed in the original boxes for three seasons. They were also found on wine jugs, barrels and boxes in the same cellar after this introduction. This is the only instance known to me where Atropidæ remained where dampness existed. I have noted this form active on April 28, and it is probably the first Psocid to resume activity in the spring. One of the most remarkable features in the life history of this species, in some instances, is the early development and deposition of eggs which occurs already in stage III, the next to last moult. When these gravid female nymphs are seen running among the males and females, the picture is so striking that they seem to be a widely different species, for they are much larger than even their nongravid mothers, and are of a bright yellow color.

The eggs are eliptical in shape. The adult usually deposits from five to seven and glues them fast in cracks or other favorable places. They hatch in from eight to ten days, according to conditions.

The nymphs moult apparently three times. A great divergence in the development occurs between male and female, since the former is born blind and the latter has from three to five ocelli as it issues from the ovum. These blind males have no trace of any development toward the formation of eyes in stage I, and the eye does not develop until late in nymphal life; they frequently have but two or three ocelli by the time the latter part of stage III is reached; while at the same time the

ocelli—between the eyes—become discernible through the appearance of glassy facets, but do not have a fully developed base. The antennæ, at birth, have six or seven articulations aside from the two larger constituting the base. The wings are also much slower in developing than those of the female. The antennæ after the first moult—stage II—are composed of from twelve to fifteen articulations beyond the base. Small wingpads now make their appearance. The males are smaller and receive the peculiar color marks of the abdomen, which is not the case with the female until the last moult setting forth the adult form.

The lack of development of the eyes in the male nymphs is accompanied by remarkable development of some other parts, e. g. some specimens are found with the antennæ having even more articulations than are found in the imago, while the eye is rudimentary. The nymphs of both sexes in stage III have two-jointed tarsi and from nineteen to twenty-three articulations in the antennæ. The female nymphs in this stage are of a beautiful faint yellow, with the head of an amber tint. The thorax is of a light reddish-brown color. The ocelli are plainly marked and the eyes are not fully developed. The antennæ contain sixteen to twenty-four articulations. The tarsi two-jointed. This latter structural difference, and the short, broad, and uniformly bright yellow-colored abdomen of the gravid female nymph contrasts it readily from the regular female imago of the same species, which is marked as shown in Fig. 1.

Five large gravid female nymphs taken September 5, 1905, and put in a bottle, were soon thereafter found to have deposited three eggs, but they did not hatch. In these gravid nymphs the tarsi were two-jointed. Antennæ from sixteen to twenty-four articulations beyond the basilar portion. Wings large but no venation. By September 8th they were moulted and had the color of the adult female as per Fig. 1.

These facts of early oval development occur undoubtedly without the intervention of male and female, and indicate that we have the data of parthenogenesis exemplified in this species.

The Bumblebees of Southern Maine.

By JOHN H. LOVELL, Waldoboro, Maine.

The bumblebees of New England have received very little attention since the publication of the late Dr. Packard's paper in the Proceedings of the Essex Institute, in 1864. In this contribution he lists the following species as found in Maine: *B. fervidus, pennsylvanicus, terricola, virginicus, vagans* and *ternarius,* the last on the authority of Cresson. Of the species of *Psithyrus* he mentions collecting several female specimens of *P. ashtonii* at Brunswick, Maine. It is the object of the present paper to enumerate the species taken in southern Maine, at Waldoboro, and to give a few of the more important flower-records. The earliest date in spring on which females of *Bombus* have been observed is April 30th, when B. *terricola* and B. *ternarius* have been found visiting the aments of *Salix discolor.* During the autumn of the current year (1906) I made a special effort to determine the latest date any of the species continued on the wing. On September 18th, a mild, clear day, I found no bumblebees on the asters and goldenrods, though there were many honeybees at work on the latter. In a field of red clover (*Trifolium pratense*), however, specimens of *B. consimilis, fervidus* and *borealis* were still fairly common. Very likely they continued to fly for a few days longer, but on the night of September 24th there was a hard frost, killing all tender garden plants and turning black nearly all of the clover heads. The following day was clear, warm and calm and butterflies were still flitting about over the clover field, but no bumblebees were to be seen.

Apis mellifera L.

1758, *Apis mellifera* L., Syst. Nat. (10th ed.), p. 576.
1761, *Apis mellifica* L., Faun. Suec., p. 421.

Dalla Torre in his catalogue, following the law of priority, has given preference to the earlier name *mellifera,* which has also been adopted in the publications of the U. S. Department of Agriculture. The question of the nomenclature of the honeybee has been fully discussed by Mr. Frank Benton in Proc. Ent. Soc. Wash., 6, 71, 1904. "Why Linnæus chose to change the name is not apparent," but it is suggested by Mr.

Benton that as there were no zoological canons to interfere, Linnæus considered that *mellifica* (honey-makęr) was more appropriate than *mellifera* (honey-bearer.) Now after the lapse of nearly 150 years the older name is very properly restored.

All of the workers of *A. mellifera* which I have taken in this locality are black or German bees, or are hybrids between this and the Italian variety. The black bee is so called because the entire dorsum of the abdomen is black, while pure Italians have yellow bands on the basal three abdominal segments. By selection bee-culturists have also produced four and five-banded Italians. Hybrids, which can be easily distinguished, are marked with only one or two yellow bands, but hybrids may be entirely black. Wild colonies living in hollow trees in the forest are not uncommon in this locality.

The writer has two colonies of black bees which are kept largely for purposes of observation. In the spring of 1906 they left the hive for their first flight on March 28th, a mild sunny day, with a temperature of 48° F. in the shade. Numbers of the bees which alighted on the snow became chilled and perished. The preceding month of January was exceptionally warm throughout the Northern States, and at Zanesville, Ohio, in latitude 40°, the maximum temperature on the 21st and 22d was 70° and 71° F. respectively, and the honeybees flew as freely as in the springtime, "carrying great loads of pollen from the maples." They were also flying on six other days in this month. At Waldoboro they still continue to leave the hives on every mild day in November. Providing the temperature be sufficiently high, the honeybee then may fly any day in the year. Strictly speaking, the domestic bee does not hibernate, since they consume food throughout the winter, and can endure a temperature below 40° F. for only a few days. (For experiments in chilling bees see Gleanings in Bee Culture, 34, 202. Feb. 15. 1906.)

BOMBIDAE.

Bombus terricola Kirby.

1837, *Bombus terricola* Kirby ♀, Faun. Bor. Am., 4, 273.
1863, *Bombus terricola* Cr., ♀ ☿, ♂, Proc. Ent. Soc. Phil., 2, 99.
1864, *Bombus terricola* Packard, ♀ ☿, ♂, Proc. Essex Inst., 4, 112.

♀.—Scutellum sometimes entirely black, but often yellowish; margin of the 5th abdominal segment fringed apically with yellow hair. The female has been taken on *Salix discolor*, April 30; *S. bebbiana*, May 13; *Rhodora canadensis*, May 28; *Aesculus hippocastanum*, May 31; *Rosa humilis*, July 10, and a variety of other flowers as *Cornus alternifolia*, *Viburnum alnifolium* and *Gaylussacia resinosa*.

☿.—All of the workers have the scutellum black, but the apical margin of the fifth segment is fringed with yellow. Collected on *Rosa humilis*, July 10; *Aralia hispida*, July 16; and later on many midsummer and August flowers, as *Solidago bicolor*, *Gaultheria procumbens* and *Vicia cracca*.

♂.—As remarked by Packard, the male might easily be mistaken for a worker; but the clypeus, which in the worker is smooth, is densely bearded with yellow hair in the male; the scutellum is sometimes black, but often with an admixture of yellow hair. Found visiting the flowers of *Aralia hispida*, July 15; *Epilobium angustifolium*, July 23; and later on *Solidago bicolor* and *Eupatorium perfoliatum*.

Bombus ternarius Say.

1838, *Bombus ternarius* Say, ♂, Boston Jour., Nat. Hist., 1, 414.
1863, *Bombus ternarius* Cr., ♀ ☿, ♂, Proc. Ent. Soc. Phil., 2, 104.
1864, *Bombus ternarius* Packard, ♀ ☿, ♂, Proc. Essex Inst., 4, 116.

♀.—the yellow pubescence on the scutellum is in some specimens separated into two spots as in *B. bifarius*, which is probably only a variety of this species. Captured on *Salix discolor*, April 30; *S. bebbiana*, May 12; *Aesculus hippocastanum*, May 31; also on *Rhodora canadensis* and *Gaylusaccia resinosa*.

☿.—The workers are much smaller than the females and the front is nearly black. Taken on *Rhus typhina*, July 10; *Solidago*, September 8; also on *Aralia hispida* and *Eupatorium perfoliatum*.

♂.—The form of the male is more slender than that of the worker. I have taken it only on *Solidago bicolor*.

Bombus fervidus Fabr.

1798, *Apis fervida* Fabr., Suppl. Ent. Syst., p. 274.
1808, *Bombus fervidus* Fabr., Syst. Piez., p. 352.
1863, *Bombus fervidus* Cr., ♀ ☿, ♂, Proc. Ent. Soc. Phil., 2, 93.
1864, *Bombus fervidus* Packard, ♀ ☿, ♂, Proc. Essex Inst., 4, 110.

♀.—Collected on *Rhodora canadensis*, May 28; *Aesculus hippocastanum*, May 31; *Falcata comosa*, August 22; and *Trifolium pratense*, September 18.

☿.—On *Pontederia cordata*, July 20; *Falcata comosa*, August 22; also on various garden flowers.

♂.—The male has been taken on the pasture thistle from July 30th to September 18th.

Bombus borealis Kirby.

1837, *Bombus borealis* Kirby, Faun. Bor. Am., 4, 272.
1864, *Bombus borealis* Cr., ♀ ☿, ♂, Proc. Ent. Soc. Phil., 3, 41.

Bombus borealis differs from *B. fervidus* in the following characters: the pubescence is tawny yellow; the clypeus is smooth and shining, impunctate; the face between the clypeus and ocelli is clothed with pale yellow and the vertex with tawny yellow pubescence; the yellow pubescence of the thorax does not extend downward upon the pleura, and the black band between the wings is wider. *B. fervidus* has the pubescence lemon yellow; the clypeus sparingly punctured; the front black except for a few yellow hairs above the insertion of the antennæ, the vertex black; and the pleura is largely yellow. Both sexes and the workers have been taken in this locality, but they are much rarer than the corresponding forms of *fervidus*. I have no record of the capture of the females in spring. The workers have been taken on *Pontederia cordata*, which blooms from July 21st to August 10th; on *Vicia cracca;* and on *Trifolium pratense*, September 18th.

Bombus consimilis Cr.

1864, *Bombus consimilis* Cr., ♀, Proc. Ent. Soc. Phil., 3, 41.

This is our most common species of *Bombus*, and according to Cresson it occurs also in Massachusetts and Canada. I have compared the local bees with an authentic set of specimens received from Mr. H. L. Viereck, with which they very closely agree. In one instance a female of this species has only the basal middle of the second segment yellow, resembling *B. ridingsii* Cr., of which I have specimens from New Haven, Conn.

♀.—On the inflorescence of *Salix bebbiana*, May 13; *Lonicera ciliata*, May 18; *Rhodora canadensis*, May 28; *Clintonia borealis* and many other plants.

☿.—Taken on *Rhus typhina,* July 10; *Epilobium angustifolium,* July 23; *Pontederia cordata,* July 20; *Falcata comosa,* August 22; and *Trifolium pratense,* September 18.

♂.—The male may be easily distinguished from the worker by a long tuft of pale yellow hair below the antennæ. On *Pontederia cordata,* July 20; and *Epilobium angustifolium,* July 30.

Bombus bimaculatus Cr.

1863, *Bombus bimaculatus* Cr., ♂, Proc. Ent. Soc. Phil., 2, 92.

This species is probably only a variety of *B. vagans* Sm., from which it differs chiefly in having a round black spot on each side of the second abdominal segment. This character is, however, variable, and I have specimens which have the second segment entirely yellow. The female of *B. bimaculatus* is rather common on *Rhodora canadensis* and I have also taken it on *Diervilla trifida.*

Psithyrus ashtonii Cr.

1864, *Apathus ashtoni* Cr., ♀, Proc. Ent. Soc. Phil., 3, 42.
1864, *Apathus ashtoni* Packard, ♀, Proc. Essex Inst., 4, 118.
1896, *Psithyrus ashtonii* D. T., Cat. Hym., 10, 565.

The female was taken on *Vaccinium,* June 16; and *Solidago juncea,* August 4. The male, which is undescribed, is smaller than the female, and the yellow and black pubescence is similarly distributed, except that the first segment is clothed laterally with lemon-yellow hair. Observed on *Epilobium angustifolium,* July 23; *Aralia hispida,* July 27; and the goldenrod, August 21. In fresh specimens the pubescence is a bright lemon-yellow, fading with age to grayish-yellow.

Psithyrus laboriosus Fabr.

1804, *Apathus laboriosus* Fabr., ♀, Syst. Piez., p. 352.
1854, *Apathus citrinus* Sm., ♂, Cat. Hym. Brit. Mus., 2, 385.
1863, *Apathus laboriosus* Cr., ♀, Proc. Ent. Soc. Phil., 2, 111.
1863, *Apathus citrinus* Cr., ♂, Proc. Ent. Soc. Phil., 2, 112.
1863, *Apathus contiguus* Cr., ♂, Proc. Ent. Soc. Phil., 2, 112.
1864, *Apathus citrinus* Packard, ♂, Proc. Essex Inst., 4, 119.
1864, *Apathus contiguus* Packard, ♂, Proc. Essex Inst., 4, 119.
1903, *Psithyrus laboriosus* Robt., ♀, ♂, Trans. Am. Ent. Soc., 29, 178.

The female has been collected on *Pontederia cordata,* July 21; *Inula helenium,* August 6; and *Solidago,* September 3.

In Proc. Ent. Soc. Phil. 3: 247, 1864, Walsh makes the following observation: "I may add here, that as I have recently captured 17 ♂ ♂ of *Apathus citrinus* Smith in company with 4 ♀ ♀ of *A. laboriosus* Fabr., and as the ♀ of the former and the ♂ of the latter species appear to be unknown, I incline to believe them to be the sexes of one and the same species." The male resembles *Bombus perplexus*, and was so determined for me some years ago by an eminent entomologist; it is common in this locality on *Epilobium angustifolium* from July 20th to August 18th.

Psithyrus contiguus Cr. differs from the male of *P. laboriosus* only in having the first two instead of the first three segments lemon-yellow. In 1887 (Syn. Hym. N. Am. p. 307), Cresson considered it as only a variety of *P. citrinus*. After a careful examination of a rather large series of the males of *P. laboriosus* I find that the third segment may be entirely black, partially black, or that the yellow pubescence may be mixed with black. *P. contiguus* is doubtless only an instance where the yellow fails entirely; it has been taken July 30th on *Carduus odoratus*.

CERATINIDAE.

Ceratina dupla Say.

1837, *Ceratina dupla* Say, ♀ ♂, Bost. Jour. Nat. Hist., 1, 387.
1864, *Ceratina dupla* Cr., ♀, ♂, Proc. Ent. Soc. Phil., 2, 389.

I take this opportunity to place on record the occurrence of *C. dupla* in this locality. The female has been taken from July 4th to August 21st on the rose, thistle and goldenrod. I have also specimens of both the male and female of this species, and of the male of *C. tejonensis* Cr. from Elkhart, Indiana, collected by R. J. Weith.

Melalopha inornata (Neumœgen).—Last September Professor V. A. Clark sent me a number of larvæ, which had been found defoliating cottonwood (*Populus*) trees at Prescott, Arizona. The larvæ pupated on the way, and I was not able to determine them until recently, when a couple of fine *M. inornata* emerged. According to Packard's great work on the Notodontidæ, the precise locality of this species was unknown, and nothing had been recorded about its transformations.—T. D. A. COCKERELL.

The Differentials of Three North American Species of Libellula.

By Philip P. Calvert.

In the News for January, 1907, p. 30, was mentioned that, during our recent trip to Mexico, *Libellula flavida* (Hagen, not Ramb.), new to that country, was taken. This capture has led me to study this species, in order to include it in the Supplement to the Odonate part of the Biologia Centrali-Americana.

In a footnote to page 73 of Prof. J. B. Smith's List of the Insects of New Jersey (27th Annual Report, New Jersey State Board of Agriculture, Supplement, 1900), I stated, "I have examined Rambur's presumed type of *flavida* at Oxford, England. It is identical with *plumbea* Uhler, and therefore different from *flavida* Hagen, which latter will require a new name." For *flavida* Hagen (nec Rambur), I now propose **Libellula comanche.**

The nearest allies of *Libellula comanche* are *L. flavida* Ramb. and *L. cyanea* Fabr. These three species agree in having the discoidal triangle of the hind wings cross-veined, supratriangular cross-veins usually present on the front wings, usually absent on the hind, one cubito-anal (submedian Selys*) cross-vein, a bicolored pterostigma, and abdominal segment 8 of the female perfoliate.

The differentials of these three species follow. Having before me 7 ♂, 4 ♀ each of *comanche* and of *flavida*, I have used the same number of *cyanea* for this comparison; all the available males of *comanche* are pruinose.

Character.		*L. comanche*, nom. nov. (*flavida* Hagen.)	*L. flavida.* (*plumbea* Uhler).	*L. cyanea.* (*quadrupla* Say.)
Vertex at apex.		With a yellow or orange spot.	Without such a spot.	Without such a spot.
Frons	♂	Cream-yellow.	Bluish-black.	Greenish-brown (young) to bluish-black.
	♀	Cream-yellow to orange.	Reddish-yellow to greenish-brown.	Greenish-yellow to olive.

* The Comstock-Needham wing-vein nomenclature is here employed, the Selysian synonyms being added in parentheses.

Character.	*L. comanche*, nom. nov. (*flavida* Hagen.)	*L. flavida.* (*plumbea* Uhler.)	*L. cyanea.* (*quadrupla* Say.)
Nasus ♂	Pale greenish-yellow.	Olive to blackish-brown.	Brown to black.
Nasus ♀	Pale greenish-yellow.	Yellow to olive.	Greenish-yellow to olive.
Labrum ♂	Yellow.	Yellow to black, very narrowly orange on free edge.	Brownish, narrowly orange on free edge, to entirely black.
Labrum ♀	Yellow to orange.	Yellow.	Yellow to greenish-yellow.
Darker basal coloring of the wings.	Ochraceous extending distad halfway, more or less, to first antecubital, and halfway, more or less, to cubito-anal cross-vein (almost absent in the front wings of a Californian male.)	A dark ochraceous or blackish-brown subcostal streak to first, second or third antecubital; cubital (submedian) space ochraceous halfway to (front wing), or reaching distal to (hind wing), the cubito-anal cross-vein.	A blackish-brown subcostal streak extending to the first or second (front wing), to the second or third (hind wing), antecubital; cubital space ochraceous halfway to (front wing), or nearly reaching (hind wing), the cubito-anal cross-vein.
Subcostal space distal to the darker basal coloring ♂	Uncolored.	Distinctly yellow.	Uncolored.
Subcostal space distal to the darker basal coloring ♀	Pale yellow.	Distinctly yellow.	Yellow.
First and second series of postcubital spaces	With barely a trace of yellow (absent in a Californian male).	Yellow or ochraceous.	Pale yellow, more marked in the first series.
Brown at apex of wings of female reaching proximad	1.5 mm., halfway to distal end of stigma.	3-5 mm., to distal end, or to distal fourth, of stigma.	2-2.5 mm., two-thirds way to distal end of stigma.
Pterostigma.	♂. Proximal two-thirds cream-yellow, remainder blackish-brown.	♂, ♀. Proximal three-fourths to five-sixths, or almost entirely, ochre-yellow, remainder blackish-brown.	♂♀. Proximal half to three-fifths cream-yellow, remainder blackish brown.

Character.	*L. comanche*, nom. nov. (*flavida* Hagen.)	*L. flavida.* (*plumbea* Uhler.)	*L. cyanea.* (*quadrupla* Say.)
Pterostigma.	♀. Proximal half ochraceous, remainder blackish brown.		
Number of cells in internal triangle, front wing.	8-4 (6 and 5 equally the more frequent).	7-4 (5 most frequent).	5-3 (3 most frequent).
Posttriangular rows to level of separation of M_1 (principal sector), and M_3 (median sector), front wing.	4	4-3 (3 most frequent.	3
Do., hind wing.	3	3-2 (2 followed by 3 most frequent).	2-2 followed by 3 (2 most frequent)
Number of rows of cells between M_4 (short sector) and supplement next below, hind wings.	2	2-1 (1 most frequent).	1
Length, in mm.			
Abdomen ♂	36-32.	31.5-28.	30-27.5.
Abdomen ♀	34-31.	31-27.	27-25.
Hind wing ♂	42.5-37.	38-36.	36-33.
Hind wing ♀	41-40.	40-36.	35-33.
Costal edge of stigma, front wing. ♂	5-3.5.	6-5.5.	5-4.5.
Costal edge of stigma, front wing. ♀	6-5.5.	6-5.5.	5-4.5.
Width of hind wing at right angles to costa at level of posterior angle of discoidal triangle. ♀	12-10.5.	10-9	10.5-9.3.
Width of hind wing at right angles to costa at level of posterior angle of discoidal triangle. ♀	11-10.	10.5-8.5	9
Maximum width of head ♂	8-7.	7-6.7.	6.8-6.25.
Maximum width of head ♀	7.7-7.5.	7	6.3
Maximum width of thorax. ♂	8-6.	6-5.5.	6-5.5.
Maximum width of thorax. ♀	7-6.7.	6 4-5.	5.7-5.2.

	L. comanche, nom. nov. (*flavida* Hagen.)	*L. flavida.* (*plumbea* Uhler.)	*L. cyanea.* (*quadrupla* Say.)
Distribution:	Montana; Yellowstone; Ontario in California (July, 1 ♂, Snodgrass); Dallas, Waco, Round Mountain (June, Schaupp, 4 ♂, 4 ♀), and Pecos River, Texas; Santa Rosalia Springs (August, Calvert, 2 ♂), in Chihuahua, Mex.	N. Jersey to Georgia. (I have studied 3 ♂, 1 ♀, Haddonfield, August, Rhoads, and 1 ♂, Lakehurst, July, Davis, in N. J., 1 ♂, vicinity of Philadelphia?; 1 ♀, Mitchell Co., N C., July, Skinner; 2 ♂, 2 ♀, Greenville, S. C., Patterson and Calvert.)	Manchester, New Hampshire to Greenville, South Carolina, west to Indiana.

Notes on some species of Geometrids.

By HARRISON G. DYAR, Washington, D. C.

In the April number of ENTOMOLOGICAL NEWS, Mr. John A. Grossbeck has some notes on some of Hulst's types of *Geometridae*, which takes the form of a criticism of my own notes on these types. Mr. Grossbeck has been studying the material at his convenience, and it is not surprising if he has been able to correct my own more hurried notes. I am, however, disposed to maintain my original position in respect to some of the determinations.

Hydriomene curvilinea Hulst.

I cannot concur in Mr. Grossbeck's separation of *curvilinea* and *occidens*. I have a good series of the species from the northwest, and the differential characters noted come within the range of variation.

Hydriomene amorata Hulst.

Mr. Grossbeck admits that one of the types is *Petrophora defensaria* Guen., but would hold the name on the other type.

I think, however, that the name should fall, for if one type is not *defensaria,* it is *convallaria.* I feel quite sure that there is not a third species so marked.

Somatolophia umbripennis Hulst.

Mr. Grossbeck has discovered that the type is a ♂ without antennæ and with a ♀ abdomen of another species cleverly attached. Making the necessary correction, *Somatolophia* Hulst becomes a synonym of *Selidosema,* but the species *umbripennis* is distinct from *haydenata.* I have gone over my material and am able to recognize both species. They are remarkably alike, not only in markings, as Mr. Grossbeck admits, but also in color, for of my eleven *umbripennis* (without ♂ hair pencil), several are fully as light in color as the *haydenata.* The description of the larva of *Alcis haydenata* Pack. (Proc. U. S. Nat. Mus., XXV, 390, 1903) must be credited to *Selidosema umbripennis* Hulst.

Cymatophora festa Hulst.

Mr. Grossbeck finds this to be a synonym of *Macaria sequiferaria* Walk., instead of *Delinia pulveraria* Hulst, as found by me. I cannot explain this discrepancy, except through some mistake on my part. The species are certainly different enough.

Selidosema correllatum Hulst.

Mr. Grossbeck divides the species, limiting it to the Colorodan type, and describing the Californian type as *pallescens.* In the U. S. Nat. Mus. is also a type of *correllatum* from California and two other specimens. I suppose these represent *pallescens,* but the specific distinctness of it is scarcely obvious to me, if the specimen that I have from Ormsby Co., Nevada (C. F. Baker) is the true *correllatum,* as I suppose. Much more distinct is *sericeata* Hulst, of which I have a type from Prescott, Arizona, and also four recent specimens from Williams, Ariz. (Schwarz and Barber). Mr. Grossbeck is surely in error in citing the species as a synonym to *correllatum.*

MR. WM. SCHAUS has been collecting in Central America since September, 1905. His present address is San José, Costa Rica.

Our species of Plagodis Hübn.

By Richard F. Pearsall, Brooklyn, N. Y.

The species which fall under this genus are rather well defined, and it would seem quite unnecessary to revise them. A curious mingling of two species under one name has occurred, however, in the case of *keutzingi* Grote. As Dr. Packard was about to publish his monograph in 1876, Professor Grote sent him a specimen, with description, he says, and name, *keutzingi* for publication (Can. Ent., VIII, p. 112). Doctor Packard mingled with it specimens from various places, which he described under the name of *keutzingaria* Pack., and figured them (Mono. plate XI, fig. 44), referring to the Grote specimen, in a few descriptive lines as a darker form. This drew a vigorous protest from Grote (Can. Ent., VIII, p. 154), who insisted that his name, *keutzingi,* should hold. Whether as the result of this or not, I do not know, but a figure of the Grote specimen appears (Mono. plate XIII, fig. 51), and in listing them (Dyar) *keutzingaria* Pack. is made a synonym of *keutzingi* Grote. Here the error occurs. I have taken both in the Catskill Mountains, the latter rarely, and they are about as distinct, one from the other, as could well be. Both names cannot have a place on our list as separate species, and as that of Professor Grote is recognized as entitled to priority, I propose for the other species the name *altruaria* with *keutzingaria* Pack, as its synonym. On the occasion of a recent visit to Reading, I saw in the collection of the late Doctor Strecker a ♂ and ♀ of a species, a single ♂ of which, taken at Scranton, Pa., came to me some two months ago, through the kindness of Mr. M. Rothke, of that city. They were labeled *Plagodis purpuraria* Pack. Doctor Packard may have given this name to Doctor Strecker, but he never published any description of it. The species must be quite rare, for I have never seen it in any other collection. Those in the Strecker collection were also taken in Pennsylvania. How markedly different from our other species it is, the following description, under the name selected by Doctor Packard, will show:

Plagodis purpuraria n. sp.

Expanse 29-30 mm.; forewings deeply notched at anal angle, as in *keutzingaria,* but narrower; palpi reddish-purple, tipped with orange; front, vertex, base of patagia, and costa at base, deep reddish-purple; collar gray, tinged with lilac; antennæ yellow, tipped with violet; thorax in front, and patagia, bright brownish orange, which rapidly fades into pale yellow posteriorly; abdomen pale yellow, a few scattering scales, centrally, of jet black, at tip and beneath orange, the whole washed thinly with violet; forewings soft, bright, brownish orange without basal lines, striations, or discal spots. This color ceases abruptly, extradiscally at costa, about two-thirds out, thence inwardly in a straight line to cell, at base of vein 3, it runs nearly straight to inner border of wing, thus forming a slight angle. Inwardly along this margin there is a diffuse shading of brownish from costa to vein 3, below which black and violet shades are intermingled and form the suggestion of a vine, while outwardly a wide border, broadest centrally, of lilac scales (changing to white at costa and along it to apex), disclosing as it fades out about half way to margin, the bright, brownish orange ground color which succeeds it, submarginally from apex to notch. At inner margin the subterminal space is nearly filled with a cloud of black and purple scales, washed with lilac. Fringe orange above notch, purple within it. Hind wings pale yellow, marginally washed with orange. On inner margin two thirds from base, a blotch of orange, black and purple scales indicate the termination of a shadowy line crossing the wing centrally. Before anal angle a few black and purple scales, overspread with lilac, not so prominent as on fore wings. Fringe orange, shading into lilac at anal angle. No discal dots. Beneath forewings bright orange above cell, from base to apex below cell, almost white. A diffuse band of orange crosses both wings centrally. Hind wings pale orange basally, pale yellow to margin, beyond central cross band. No discal dots on either wings, legs brownish orange washed with purple.

Type ♂ in my collection. The ♀ in the Strecker collection should be a type and the ♂ a co-type, but I have no descriptive notes of the former, and while it presents no difference in color

or markings from my ♂ that I could discover, I refrain from giving it that standing at present. The species is a beautiful one, as will be seen, and its markings approach in style the *emargataria* Gn. That species is larger, a brown or *café au lait* color, slightly strigate, with prominent discal dots and quite different in appearance.

Kempii Hulst, the type of which is a ♀, seems to me an extreme varietal form of *alcoolaria* Gn. It is a fresh specimen, with the ground color paler, less strigate or mottled, with the cross lines more sharply drawn; otherwise the same. I would list our species as follows:

Serinaria H-Sch.
=*subprivaria* Walk.
=*floscularia* Grote.
var. *rosaria* Grote.
Keutzingi Grote.
=*nigrescaria* Hulst.
Altruaria Pears.
=*keutzingaria* Pack.
Fervidaria H-Sch.
=*excurvaria Mor.*
Alcoolaria Gn.
var. kempii Hulst.
Phlogosaria Gn.
Emargataria Gn.
=*arrogaria* Hulst.
Purpuraria Pears.
Approximaria Dyar.

THE VITALITY and power of resistance of the sheep tick, *Melophagus ovinus* Linn. Being interested in a woolpulling establishment, I have had the opportunity of observing the terrible punishment inflicted upon the sheep ticks, after the sheepskins are brought into the shop, and how they come out whole and very much alive after said punishment. The skins are brought in all day up to six o'clock P. M., and are put into large cement vats with running water, in which the skins are totally submerged; they remain in these vats over night, and the following morning are run through a scrub machine, a machine for cleaning the wool, with steel blades on a cylinder, revolving nine hundred times per minute; these blades and the force of water make the wool as white as the driven snow, taking out burs and dirt. The skins are then put into a hydro-extractor revolving twelve hundred times a minute, from which the skins come out very nearly dry; they are then painted on the pelt side with a very strong solution of sulphide of sodium, folded, wool out, and laid in piles twelve high; in this position they remain for at least twenty-four hours, when they go to the pullers' beams, and it is here that the pullers have their troubles, for unless they see the ticks first, the latter will get under their clothing wherever there is a chance, and try to make up the time lost in the two or three days' fast. They finally succumb, however. after the wool is pulled and goes into the drying machine, where the temperature is two hundred and fifty degrees Fahrenheit.—FRANK HAIMBACH, Philadelphia.

Records of Orthoptera from the Vicinity of Brownsville, Texas.

By James A. G. Rehn.

Although the Orthoptera of the Brownsville region have been well examined and reported on at length by Caudell,* the following records may add desirable information regarding the occurrence of certain species not included in that paper, and, taken with the work mentioned above, give a comprehensive summary of the Orthoptera of that region. Three species are here added to the fauna of the United States and nineteen are additional to Caudell's paper, in which forty-six were recorded.

The material collected by Mr. Schaeffer is in the collection of the Brooklyn Institute of Arts and Sciences and that obtained by Prof. Snow in the cabinet of the University of Kansas. The author wishes to thank both of these gentlemen for the privilege of examining the material from these institutions.

FORFICULIDAE.

Spongiphora apicidentata Caudell.

Isabel, August 5. (Schaeffer.) 1 ♂.

Apterygida linearis (Eschscholtz).

Brownsville, June. (Snow.) 1 ♀.

BLATTIDAE.

Pseudomops oblongata (Linnaeus).

Brownsville, June. (Snow.) 1 ♀.

This specimen represents true *oblongata*, agreeing fully with individuals of this species from Morelos, Mexico, and Costa Rica.

This record is the first of the species within the United States.

Chorisoneura texensis Saussure and Zehntner.

Brownsville, July. (Snow.) 1 ♂.

Pycnoscelus surinamensis (Linnaeus).

Brownsville, June. (Snow.) 1 ♀, 1 nymph.

* Bull. Brooklyn Inst. Arts and Sciences, I, No. 4, pp. 105-116, pl. vi-vii, 1904.

Homoeogamia bolliana Saussure.

Brownsville, June. (Snow.) 1 ♂.

This specimen is more infuscate than usual in central Texan specimens, but it is not the extreme dark form to which Caudell has applied the name *nigricans* (l. c. p. 107).

Latindia schwarzi Caudell.

Brownsville, June. (Snow.) 1 ♂.

This specimen is slightly smaller than Caudell's original measurements, the tegmina being 5.5 instead of 7 to 8 millimetres in length.

MANTIDAE.

Stagmomantis carolina (Linnaeus).

Brownsville, June. (Snow.) 1 ♂.

Bactromantis virga Scudder.

Brownsville, June. (Snow.) 1 ♀.

Theoclytes chlorophaea (Blanchard).

Brownsville, June. (Snow.) 1 immature individual.

This specimen has been compared with an adult from Mexico.

PHASMIDAE.

Diapheromera persimilis Caudell.

Brownsville, June. (Snow.) 1 ♀.

As far as can be determined from the female sex this specimen appears to belong to Caudell's species.

ACRIDIDAE.

Apotettix brevipennis Hancock.

Esperanza Ranch, Brownsville, Aug. 13. (Schaeffer.) 1 ♀.

This species was described from Paige, Texas.

Paratettix texanus Hancock.

Brownsville, June. (Snow.) 1 ♂, 1 ♀. Esperanza Ranch, Brownsville, July. (Schaeffer.) 1 ♀.

Orphulella picturata Scudder.

Brownsville, June. (Snow.) 1 ♂, 1 ♀.

These specimens are not as highly colored as Galveston individuals.

Opeia pallida Bruner.

Brownsville, June. (Snow.) 1 ♂, 1 ♀.

These specimens appear to belong to this species, which was

described from Montelovez, Coahuila, Mexico. The lateral carinae of the pronotum are slightly converging cephalad as described by Bruner.

Chortophaga viridifasciata (De Geer).

Brownsville, June. (Snow.) 1 ♂.

Encoptolophus fuliginosus Bruner.

Esperanza Ranch, Brownsville, May and August 1st. (Schaeffer.) 2 ♂.

These specimens are referred to this species with a little uncertainty, but almost entirely on account of the distance between the type locality (Colonia Garcia, Chihuahua, Mexico) and that given above. In structure these specimens appear to fully agree with the original description and tally thoroughly in the dimensions.

Encoptolophus texensis Bruner.

Brownsville, June. (Snow.) 1 ♂. Esperanza Ranch, Brownsville, August 17th. (Schaeffer.) 1 ♀.

These specimens appear to be quite typical, except that the two females vary in the length of the tegmina and of the caudal femora.

Spharagemon cristatum Scudder.

Brownsville, June. (Snow.) 1 ♀. Esperanza Ranch, Brownsville, June. (Schaeffer.) 1 ♀.

The Esperanza Ranch individual has the pronotal crest higher caudad than in the other specimen, the same portion being bulbous dorsad. The Brownsville specimen has this region more rugose and with the arch lower as well as the caudad angle of the pronotum less produced though acute.

Tomonotus aztecus (Saussure).

Brownsville, June. (Snow.) 1 ♂, 1 ♀.

These specimens have been compared with Mexican specimens.

Mestobregma texanum (Saussure).

Brownsville, June. (Snow.) 1 ♂, 1 ♀. Esperanza Ranch, Brownsville, June 25th and August 3d. (Schaeffer.) 1 ♂, 1 ♀.

Schistocerca alutacea (Harris).

Between Alice and Brownsville, July. (Schaeffer.) 1 ♂.

Schistocerca obscura (Fabricius).

Brownsville, June. (Snow.) 1 ♁.

TETTIGONIDAE.

Orchelimum vulgare Harris.

Brownsville, June. (Snow.) 1 ♀.

Xiphidion fasciatum (De Geer).

Brownsville, June. (Snow.) 1 ♂, 2 ♀.

Stipator sp.

Brownsville, June. (Snow.) 1 ♂, 1 ♀.

GRYLLIDAE.

Gryllotalpa borealis Burm.

Esperanza Ranch, Brownsville, May 25th. (Schaeffer.) 1 ♁.
This specimen is one of the long-winged type (*columbia*).

Ellipes minuta (Scudder).

Brownsville, June. (Snow.) 1 ♀.

Nemobius neomexicanus Scudder.

Brownsville, June. (Snow.) 1 ♂, 1 ♀.

Nemobius sp.

Brownsville, June. (Snow.) 1 ♂.

Gryllus luctuosus Serville.

Brownsville, June. (Snow.) 1 ♁.
This individual belongs to the form *abbreviatus*.

Anaxipha exigua (Say).

Brownsville, June. (Snow.) 1 ♁.

Oecanthus quadripunctatus Beutenmüller.

Brownsville, June. (Snow.) 1 ♂, 1 ♀. Esperanza Ranch, Brownsville, August 18th. (Schaeffer.) 1 ♀.

Oecanthus pini Beutenmüller.

Brownsville, June. (Snow.) 1 ♀.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., MAY, 1907.

We have always made it a point to take our subscribers and well-wishers into our confidence and tell them our aims and hopes and what we propose to do. It has always been our ambition to improve the NEWS in every way in our power and not increase the price of subscription. It is our wish at the present time to publish at least fifty pages a month, and give twenty-five full plates in each volume. In the last number issued we had fifty-two pages and six full-page plates. The articles we are publishing are of great scientific interest and we are getting many papers of this class. The increased number of pages will enable us to get them out promptly.

We are also endeavoring to have the copies mailed by the first of each month. We are thus doing all we can, and the rest must be done by our subscribers. Every new subscription we get enables us to improve the NEWS, so it is to the interest of all to aid us as far as possible in this way.

We believe we are publishing the best monthly entomological journal in the world at such a moderate price. We would like more color plates, and trust an increased subscription list will enable us to achieve this very desirable addition to the value of the NEWS.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

WILL name Micro-Lepidoptera—all families except Phycitinae.—W. D. KEARFOTT, Montclair, N. J.

A. L. MELANDER, Agric. Exper. Station, Pullman, Washington, will name Empididæ and fossil Diptera.

HENRY ENGEL has removed from Pittsburgh, Pa., to New Brighton, Pa. Correspondents are requested to kindly address letters and parcels as follows: Merrick Museum, 5th Ave. and 11th St., New Brighton, Pa.

FARMINGTON—Ah, there's that old poem about husking bees. I always did like that.

DUMLEY—Husking bees? What do you mean?

FARMINGTON—Why, were you never in the country during the season of husking bees?

DUMLEY—No. How in the world do you husk a bee?

THE LAKE LABORATORY of the Ohio State University, located on Cedar Point near Sandusky, is designed to provide a meeting ground for teachers and students of biology, to afford opportunity for the investigation of the biology of the lake region, and for giving certain courses of instruction in biological subjects.

Entomology—field and laboratory course, including instruction in collecting, mounting and identifying insects in connection with studies in life history and anatomy. Excellent opportunities for life-history studies are offered both on aquatic and terrestrial forms.

The course of instruction will open June 24th and close August 2nd, the laboratory being open longer to students desiring to continue work.

SAMIA RUBRA AND GLOVERI.—The question of the food plant having the property of changing the color values of various species has been long admitted, and in dealing with *S. rubra*, I was interested in the fact that larvæ fed on birch at Ottawa from eggs furnished by me from wild *rubra* emerged as imago of a dark gray, having little trace of the reddish tint which is so noticeable with *rubra;* this led me to the further experiment of trying to feed *rubra* on tamarack which is the recognized food of *gloveri*. I parted a batch of eggs, placing some on its native food plant *Ceanothus* and the balance on tamarack (*Sytix occidentalis*); the growth of those on the tamarack was very slow, they only passed the first stage when those of the *Ceanothus* were passing the third, and continued to develop in the same ratio. During the last stage they were offered Douglas fir and entirely forsook the tamarack for that food, on which they seemed to thrive better

than previously. Unfortunately I only secured one pupa from this brood, and, as it is doubtful if I may this year have a chance of again breeding this insect, may I ask some of our western enthusiasts to try the experiment this year to see if the food plant is the only distinguishing factor in the color and markings of this variable species?—J. W. COCKLE.

Doings of Societies.

At the meeting of the Feldman Collecting Social held Philadelphia, February 20, 1907, there were seven members present.

Mr. Harbeck exhibited his collection of the genus *Tabanus,* and remarked that Professor Hine had gone over his specimens of *nigrovittatus* and had picked out from them a number of specimens of *conterminus.*

Professor J. B. Smith exhibited slides of lepidopterous wings colored with eosin, bringing out the venation very clearly.

Mr. Haimbach has made some experiments with the coloring of wings of a number of micros, according to the method given to him by Professor Smith, with more or less success, and will attempt here to give a brief outline of it, and would be pleased to hear from others who probably have had even better success. The wings are carefully nipped off, and put in alcohol for a few minutes, then transferred into Eau de Labarraque, which is the bleaching agent; in this they are left until all the color is bleached from the wings, and then put into clear water for a short time, then back into alcohol, and from that into the eosin, where they must remain until the desired result is reached; in the case of small micros two hours will suffice, but in the larger moths twenty-four hours are required. Judgment and practice are both essential features, and each species must be treated according to its individual requirement. After the wings have been long enough in eosin, they are transferred into alcohol again to wash out the color from the wings, being careful not to leave it too long, so that the veins will not lose their color. They are then mounted on slides with Canada balsam and xylol, and left to dry, which, unless artificially done, will require a week or ten days.

FRANK HAIMBACH, *Secretary.*

At the meeting of the Feldman Collecting Social held March 20, 1907, at the residence of Mr. H. W. Wenzel, No. 1523 S. Thirteenth Street, Philadelphia, there were seven members present, and Mr. Heiner visitor.

Mr. Harbeck exhibited seven species of Diptera new to New Jersey list as follows: *Hermetia illucens* Linn., taken at Trenton, VII, 7; *Temnostoma trifasciata* Robertson, Anglesea, VI, 11; *Rivellia boscii* Desv., Trenton, V, 21; *Euthera tentatrix* Loew., Clementon, V, 30; *Sturmia nigrita* Town., Riverton, V, 19; *Protocalliphora splendida* Macq., Ashland, VII, 16, and *Discocerina parva* Loew., Ashland, V, 13.

Mr. Haimbach gave an account of the vitality and power of resistance of the sheep tick, *Melophagus ovinus,* which account will appear in another part of this number.

Mr. Haimbach exhibited the following fifteen species of recently described Micro-lepidoptera: *Crambus placidellus* Haimb., *Crambus daeckellus* Haimb., *Thaumatopsis fernaldella* Kearf., *Epinotia haimbachiana* Kearf., *Hemimena bittana* Busck, *Ancylis diminutana* Kearf., *Phalonia rana* Busck, *Phalonia atomosana* Busck, *Hysterosia merrickana* Kearf., *Carposina fernaldana* Busck, *Gelechia nigrimaculella* Busck, *Mompha engelella* Busck, *Mompha stellella* Busck, *Epermenia imperialella* Busck, and *Amydria margoriella* Dietz.

Mr. Daecke exhibited a specimen of *Pachnobia monochromatea* Morr., taken at Brown's Mills Junction, V, 20, 04, and a specimen of *Spogostylum cephus* Fab., taken by Mr. Haimbach at Roxborough, Philadelphia, VII, 8, 06. The type of this species is from South America, and is listed from Ga. Macq., Va., O. S. Cat., and St. Augustine, Fla., Johnson.

FRANK HAIMBACH, *Secretary.*

ERRATA.

Mr. H. W. Wenzel wishes to note the following correction in the minutes of December 19, 1906, ENT. NEWS, XVIII, p. 68, in his reference to the color variation in the genus *Phanaeus*, it should read *Phanaeus ignius*, instead of in the genus *Phanaeus*.

Pages numbered 164 and 165 in the NEWS for Aprll, 1907, should have been 163 and 164 respectively. After line 6, page 140, insert "type of Walker's *carbonarius* in the British Museum collec-"